

# AMATEUR SATELLITE REPORT

AMSAT® NA Newsletter for the Amateur Radio Space Program



Amateur Satellite Report is endorsed by the  
American Radio Relay League as the special interest  
Newsletter serving the Amateur Radio Satellite Community

**Number 162**  
**November 16, 1987**

**Editor:** Vern Riportella, WA2LQQ

**Contr. Editors:**

Pete Killingsworth, KD7WZ

**Managing Editor:** Bob Myers, W1XT

Copyright 1987 by AMSAT® NA, The Radio Amateur  
Satellite Corporation. AMSAT® is a registered trademark.

## **Transpolar Skitrek May Reckon Its Position Using SARSAT/COSPAS/UoSAT**

A combination of space resources may be put to use in support of a joint Canadian-Soviet polar expedition early next year. Currently under discussion is Project Nordski Comm, a plan whereby the polar expedition team will be tracked by a fleet of international satellites and their position reported back to them by UoSAT OSCAR 11's Digitaltalker experiment.

Departing in February from Cape Arktychesky in the USSR, the Transpolar Skitrek expeditionary team will ski across the North Pole arriving at the Cape of Columbia near Ellesmere Island, Canada, 90 to 100 days later. Leonid Labutin, UA3CR, is the chief radio operator of the project. Leo will work from one of the support camps to provide radio communications.

The Skitrek team will carry two Emergency Locator Transmitters (ELT). These emit specially coded beacon signals in the 406 MHz range. The signals are picked up by satellites in the international SARSAT/COSPAS program. By analyzing the Doppler shift of the transponded signals, ground personnel can determine the ELT location to within a few miles or better. There are about 6 SARSAT/COSPAS-equipped satellites in operation today. It is believed COSMOS 1861, which carries RS-10/11, also has a SARSAT/COSPAS transponder aboard. SARSAT stands for Search and Rescue Satellite Aided Tracking System. COSPAS is a Russian abbreviation for Space System for Search of Vehicles in Distress.

The addition of direct position feedback to the expeditionary team is the novel part of the plans for the project. If arrangements can be completed and approved by the appropriate authorities, the expeditionary team's position, as determined by the SARSAT/COSPAS Mission Control Center, will be automatically relayed by Telex to the University of Surrey in England. From there the position will be encoded in software which programs the UO-11 Digitaltalker. Several times per orbit, Digitaltalker would announce the team's position in plain English. The team would listen for UO-11 on 145.825 MHz on miniature VHF transceivers they carry and thus obtain vital information on their current position.

AMSAT has played an interesting historical role in the evolution of SARSAT/COSPAS. AMSAT OSCAR 7 was

employed as a proof of concept for SARSAT in December 1975. Using AO-7's Mode A transponder, signals from AO-7 received at the Goddard Space Flight center proved a low power uplink could provide sufficiently accurate tracking information with an estimated 3 to 6 km potential. The SARSAT/COSPAS program now consists of spacecraft provided by the United States and the Soviet Union. They, together with Canada and France founded the system. Today more than a dozen nations participate in the program. Officials credit SARSAT/COSPAS with having saved more than 1,000 lives to date.

AMSAT has plans to initiate a radio sport competition using the SARSAT/COSPAS system as a model. The objective will be to illustrate the technique and provide a valuable educational tool in a sport context. The competition would challenge participants to locate a hidden transmitter via an OSCAR satellite using Doppler shift analysis techniques similar to those employed by the SARSAT/COSPAS Mission Control Centers. A 1988 kickoff is planned for this project.

## **Plans Call For AO-10 Return By Mid-November**

Chances are excellent AMSAT OSCAR 10 will be released for general use in a few weeks according to the satellite command team. Tests conducted by VK5AGR on October 25 suggest the satellite is in relatively good condition. AO-10 has been unavailable for use since early August. It was pulled from service at that time when sagging sun angles reduced available power to critical levels. Now, however, sun angles are improving as predicted and it appears it will be released for general use in mid-November, two weeks ahead of the earlier estimates. Observation reports by W6WNK and others say AO-10 has been heard with strong signals in late October. The satellite had been turned on for a routine status check. Meanwhile, the IHU remains inoperative due to memory radiation damage.

Evaluation of the satellite's condition has been accomplished by VK5AGR, ZL1AOX and DB2OS. Based on their analysis, AO-10's battery is in good condition and the Mode B transponder is functioning normally. However, they caution that jumping the gun, that is, using the satellite prior to its release in mid-November could seriously jeopardize



the spacecraft. All users are strongly encouraged to await the official release date. That date has now tentatively been set at November 16.

A further caution has been issued by the command team. Graham, VK5AGR, speaking for the command team, asserts that during the next few months, when solar illumination is greater than 75%, AO-10 will be experiencing solar eclipses up to 99 minutes every orbit. For example, on November 16, AO-10 will be in solar eclipse from 0657 to 0824 UTC. This period corresponds to MA 74 to MA 106 or 87 minutes in length. In order to avoid damage to the battery, users must studiously avoid using the satellite while it's in eclipse. This had been the case previously but the eclipses then tended to occur around perigee. In the next few months, however, very long eclipses occur well after perigee.

Here is the tentative AO-10 operating schedule for the balance of 1987. This schedule is subject to change if the satellite is subject to excessively high loading or by its use during eclipses.

#### (Tentative) AMSAT OSCAR 10 Transponder Operating Schedule

Time Frame (1987)	Mode B Operating Times in MA
Nov 16 thru Nov 23	0 thru 59 and 131 thru 255
Nov 24 thru Nov 30	0 thru 69 and 141 thru 255
Dec 01 thru Dec 07	0 thru 89 and 161 thru 255
Dec 08 thru Dec 14	0 thru 99 and 171 thru 255
Dec 15 thru Dec 21	0 thru 109 and 191 thru 255
Dec 22 thru Dec 28	0 thru 119 and 201 thru 255
Dec 29 thru Jan 04	0 thru 139 and 221 thru 255

If sum, then, unless plans change at the last minute, AO-10 will be available for use beginning November 16, UTC. Please do not use the satellite prior to that time. Unauthorized use prior to November 16 may jeopardize the schedule and postpone the satellite's availability if additional recovery time is required. When released for general use, please insure your operations are in close accord with the official operating schedule. Stay in close contact with official news sources so you are aware of the latest operating conditions and schedule changes if any. And, as always, please insure you use the lowest uplink power levels so as to insure satellite health as well as good communications.

AO-10's eclipse schedule for the next two months is as follows (computed by DB2OS)

#### AO-10 Eclipses

1987 Date Mondays	Sunangle Illumin.		Eclipse-Data		
	SA	ILL%	MA in	MA out	Dura. Min.
1987 Nov 9	-51	64	61	93	86
1987 Nov 16	-44	73	74	106	88
1987 Nov 23	-36	80	86	119	90
1987 Nov 30	-29	87	100	134	93
1987 Dec 7	-22	93	114	149	96
1987 Dec 14	-15	96	127	164	99
1987 Dec 21	-8	99	141	178	101
1987 Dec 28	-1	100	153	190	99

## Net Schedule Revised With Transition to "Standard Time"

AMSAT nets returned to their winter schedule beginning the weekend of 24-25 October concurrent with the change from Daylight Savings Time to Standard Time in the U.S. In accord with prior practice, all local and regional nets maintain local time. That is, a net beginning at 20:00 Daylight Time now begins at 20:00 Standard Time.

However, nets serving an international community maintain the same UTC time. For example, the AMSAT 20 meter International Net continues to be heard at 1900 UTC Sundays on 14.282 MHz. This means it is heard one hour earlier, local time, in the U.S. where Daylight Time had been in place. Similarly, the AMSAT South Pacific Net continues to be heard at 22:00 UTC on 14.282 MHz on Saturdays.

The AMSAT 75 meter East Coast Net reverted to its former one hour format beginning Tuesday evening, 27 October. The adverse propagation conditions which caused its expansion to two hours last year have now largely mitigated. Henceforth, this net begins at 21:00 EST on 3840 kHz.

## IAF Meets In UK; UoSAT Scored Hit In Exhibition

(Story via UoSAT OSCAR-11)

The 38th Meeting of the International Astronautics Federation was held in Brighton (UK) the week of October 12. Several hundred delegates from virtually all countries attended. Associated with the meeting was an impressive exhibition with exhibitors from aerospace organizations large and small worldwide. One of the most interesting exhibits was a model of the MIR space station at the Soviet stand.

The University of Surrey exhibited the engineering model of the UoSAT-2 spacecraft accompanied by a replica of the UoS groundstation and a display showing the range of spacecraft engineering activities undertaken at UoS. Much interest was shown throughout the week in UoSAT and its capabilities.

Martin Sweeting, G3YJO, presented a paper on cost-effective spacecraft engineering and Craig Underwood presented a paper on the role of satellites in education.

## Short Bursts

- Arianespace intends to launch its next mission, V-20, in the second half of November. If this is accomplished and the V-21 launch is accomplished in January as scheduled, AMSAT's Phase 3C, manifested aboard V-22, could be launched as early as February of next year. Testing of Phase 3C by the AMSAT-DL team in Marburg is intensifying with the launch date appearing to firm. Shake and vibration and additional thermal tests are in the offing.

- The main UoSAT command station at the University of Surrey, England, was taken off the air in early October when a devastating storm raked the United Kingdom. Hundred mile an hour winds, the most severe in three centuries, did

their worst as UoSAT's famous antenna arrays were launched into an indeterminate trajectory. UoSAT operations were carried forth from the home QTH of G3YJO whilst repairs were undertaken at the University. All was back in order by late October and normal UoSAT commanding has resumed at the main station.

## Records Fall In Wake of Greenbank EME Activity

Preliminary reports suggest a number of significant records were established during the EME weekend of 17-18 October. In one of the highlights of the ARRL-sponsored event, a group of Amateurs including AMSAT's Tom Clark, W3IWI, operated the 140 foot polar mount dish at the National Radio Astronomy Observatory at Greenbank, West Virginia.

One record which seems to have been established is a new mark for the best-ever 13 cm DX. According to ZL1AOX, a Wellington station, ZL2AQE, worked the Greenbank station via the moon using 5 to 6 watts and a 4 meter dish. If sustained, this would be a new world's record for 2.4 GHz.

A one way 10 GHz link between Greenbank and I4BER in Italy was achieved. Signals received at I4BER from Greenbank were about 40 dB out of the noise according to W3IWI. The return link was not successful due to the TWT at Greenbank swamping their receiver.

A preliminary QSO count has about ninety 70 cm EME QSOs, eighteen 23 cm QSOs and eleven 13 cm QSOs. Many stations garnered their first EME contact on this occasion. Several comment the Greenbank signal off the moon was the strongest ever heard on EME. A more detailed report will be made available as soon as possible.

### AMSAT Information Services Worldwide Packet Radio BBS carrying AMSAT News Service Bulletins (Note 1) (As of October 1987)

USA	Callsign	Frequency
AZ	Camp Verde	N5EDH 145.01
AZ	Dewey	KE7CZ 145.01
AZ	Phoenix	K7BUC 144.51/5.11
AZ	Phoenix	WB7BNI 145.01
AZ	Scottsdale	K7PYK 145.05, 145.11, 147.10
AZ	Scottsdale	W1FJI 145.01
AZ	Sedona	KR5S 145.01
AZ	Yuma	WA7HRA 145.05
CA	Arroyo Grande	W6IXU 145.01
CA	Brea	WB6KAJ 145.36
CA	Camarillo	N6LJC 145.03
CA	Felton	N6IYA 145.09
CA	Fresno	N6HAV 145.09
CA	Gilroy	AA4RE 145.09
CA	Hacienda Heights	N6CUS 145.03
CA	Hollister	KE6BX 145.01
CA	Livermore	WA6YHJ 145.01
CA	North Highlands	WA6NWE 145.09
CA	Nuevo	WB7QKP 145.05
CA	Palo Alto	N6IIU 145.07
CA	Palos Verdes	WB6YMH 145.36
CA	Rancho Cucamonga	KD6SQ 145.36
CA	Redding	WD6BFC 145.01
CA	Redondo Beach	N6BK 145.01
CA	Richmond	W6CUS 145.09
CA	Richmond	WD6CMU 145.09
CA	Sacramento	N2DME 145.07
CA	Santee	WB6VSL 145.05
CA	Saratoga	NV6Z 145.07
CA	San Bernardino	N6MVS 145.05
CA	San Francisco	W6PWW 144.99
CA	Santa Cruz	W0RLI 145.09
CA	Soquel	KB6IRS 145.09
CA	Sunnyvale	N4CHV 145.09
CA	Torrance	AJ6F 145.07

CO	Colorado Springs	WB0BLV 145.01
CO	Denver	WA6ERB 145.01
CO	Loveland	K0VLD 145.01
CO	Walsenberg	KC0QJ 145.01
FL	Boca Raton	WA4ZLW 145.03
FL	Boynton Beach	KB7TV 145.03
FL	Clearwater	W4DPH 145.01, 220.57
FL	Marathon Shores	KA1ZT 145.01, 145.09
FL	Melbourne	N2WX 145.01
FL	Miami	K4TKU 145.03, 145.09
FL	Ocala	K4OZS 145.01, 145.03
FL	Orange Park	W5HUQ 145.01
FL	Oviedo	WB4HYP 145.01, 145.07
FL	Port St. Lucie	WD4KAV 145.01, (145.03 soon)
FL	Stuart	K4NTA 145.01, 145.03
FL	Sarasota	N4HAP 145.01, 145.09
GA	Atlanta	WA4VMV 145.01
GA	(Northern)	KE4ZV 145.01
IA	Ames	KI0Q 145.01
IA	Cedar Rapids	WA0RJT 145.01
IA	Des Moines	WA0JFS 145.01
IA	McCallsburg	N0AN 145.01
IN	Indianapolis	WB7QWG 145.01
IN	Peru	KD9LP 145.01
MA	Charlestown	N1BGG 145.01, 145.07
MA	Wakefield	K1UGM 145.01
MA	Lawrence	WA1WLV 145.07
MA	Lexington	K1BC 145.09
MA	Methuen	KA1MGO 145.07, 144.07/14.107
MD	Clarksville	W3IWI 145.05, 221.???
MD	Silver Spring	N4QQ 145.03, 145.05
NH	East Kingston	WB1DSW 145.05, 145.05/14.109
NH	Salem	N1DRK 145.01, 145.07
NJ	Medford	WB2MNF 145.03
NJ	Oakland	WA2SNA 145.01
NM	Albuquerque	KN5D 145.01
NM	Las Cruces	KA5ZEC 145.01
NY	Beacon	WA2RKN 145.01
PA	Harrisburg	WB3EYB 145.05
PA	Harrisburg	AK3P 145.01, 145.05
TX	El Paso	WA5JXY 145.01
UT	Salt Lake City	WA7MBL 145.01
UT	Salt Lake City	WB7TRX 145.01
WY	Cheyenne	WA7TJU 145.01

Argentina	Buenos Aires	LU4ENQ-0 145.01	AMSAT-LU, UO-11 Bltns
		LU7ABF-0 145.05	Same above + mailbox
Australia	Sones Corner	VK4BBS 14.107	by VK4AHD
Canada	Truro, Nova Scotia	VE1AOE 145.01	
England	Norwich	G3LDI 144.65/14.099	
South Africa	Johannesburg	ZS6AKV 144.675	via ZS6LAN, ZS6RYR

### Dial-up BBS

System Operator	Telephone	Location	Notes
Stephen Wilmet, WB6BDY	619-279-3921	California	300,1200
Ralph Wallio, W0RPK	515-961-3325	Iowa	300,1200,2400
Jeff Wallach, N5ITU	214-340-5850	Texas	"DataLink"
Herb Crosby, WD5EFC	713-480-1840	Texas(Houston)	PTSE Program Grp
Atlanta Radio Club	404-393-3083	Georgia	300,1200,2400
Mike Parisey, WD0GML	314-928-9549	Missouri	300,1200

### Notes:

Part 1, voice nets, was published in ASR #144. To that list please add:  
AMSAT European 20 Meter Net, 14.280 MHz, 1000 UTC Sundays, NCS:  
PA0DLO  
AMSAT LU Net, 3.737/7.137 MHz Sunday(?) 1100 local simulcast on 145.70 MHz FM



**Satellite OSCAR-9**  
 Catalog number 12888  
 Epoch time: 87291.04492102  
 Element set: 91  
 Inclination: 97.6424 deg  
 RA of node: 311.8975 deg  
 Eccentricity: 0.0003335  
 Arg of perigee: 123.8938 deg  
 Mean anomaly: 236.2740 deg  
 Mean motion: 15.30343234 rev/day  
 Decay rate: 4.580e-05 rev/day<sup>2</sup>  
 Epoch rev: 33552

**Satellite OSCAR-10**  
 Catalog number 14129  
 Epoch time: 87284.74484093  
 Element set: 311  
 Inclination: 27.4620 deg  
 RA of node: 357.8710 deg  
 Eccentricity: 0.6026827  
 Arg of perigee: 247.3929 deg  
 Mean anomaly: 40.3386 deg  
 Mean motion: 2.05885112 rev/day  
 Decay rate: -2.07e-06 rev/day<sup>2</sup>  
 Epoch rev: 3256

**Satellite OSCAR-11**  
 Catalog number 14781  
 Epoch time: 87295.64183739  
 Element set: 263  
 Inclination: 98.0868 deg  
 RA of node: 358.9175 deg  
 Eccentricity: 0.0014495  
 Arg of perigee: 60.4523 deg  
 Mean anomaly: 299.8113 deg  
 Mean motion: 14.62173009 rev/day  
 Decay rate: 2.54e-06 rev/day<sup>2</sup>  
 Epoch rev: 19432

**Satellite OSCAR-12**  
 Catalog number 16909  
 Epoch time: 87293.21255458  
 Element set: 65  
 Inclination: 50.0144 deg  
 RA of node: 1.0175 deg  
 Eccentricity: 0.0011103  
 Arg of perigee: 243.3405 deg  
 Mean anomaly: 116.6276 deg  
 Mean motion: 12.44393778 rev/day  
 Decay rate: -2.5e-07 rev/day<sup>2</sup>  
 Epoch rev: 5395

**Satellite RS-5**  
 Catalog number 12999  
 Epoch time: 87285.25782116  
 Element set: 445  
 Inclination: 82.9651 deg  
 RA of node: 204.6819 deg  
 Eccentricity: 0.0008619  
 Arg of perigee: 133.7559 deg  
 Mean anomaly: 226.4221 deg  
 Mean motion: 12.05067718 rev/day  
 Decay rate: 1.2e-07 rev/day<sup>2</sup>  
 Epoch rev: 25593

**Satellite RS-7**  
 Catalog number 13001  
 Epoch time: 87293.19068127  
 Element set: 346  
 Inclination: 82.9704 deg  
 RA of node: 192.1115 deg  
 Eccentricity: 0.0024439  
 Arg of perigee: 29.8842 deg  
 Mean anomaly: 330.3601 deg  
 Mean motion: 12.08702564 rev/day  
 Decay rate: 1.3e-07 rev/day<sup>2</sup>  
 Epoch rev: 25766

**Satellite RS-10/11**  
 Catalog number 18129  
 Epoch time: 87286.11143464  
 Element set: 129  
 Inclination: 82.9284 deg  
 RA of node: 330.9638 deg  
 Eccentricity: 0.0010698  
 Arg of perigee: 316.4634 deg  
 Mean anomaly: 43.5716 deg  
 Mean motion: 13.71879494 rev/day  
 Decay rate: 1.5e-07 rev/day<sup>2</sup>  
 Epoch rev: 1533

**Satellite mir**  
 Catalog number 16609  
 Epoch time: 87299.90626599  
 Element set: 885  
 Inclination: 51.6271 deg  
 RA of node: 196.4763 deg  
 Eccentricity: 0.0043012  
 Arg of perigee: 316.5497 deg  
 Mean anomaly: 43.0434 deg  
 Mean motion: 15.83806551 rev/day  
 Decay rate: 8.6307e-04 rev/day<sup>2</sup>  
 Epoch rev: 9685



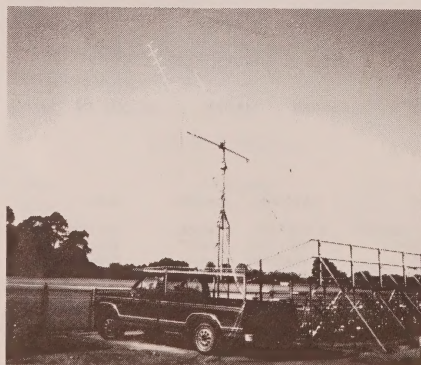
Working the AMSAT booth at the ARRL West Gulf Division Convention in Austin in August were (left) Dave Johnson, KA5HSA and Keith Bergland, WA5ZDP. Others there but not in picture were Andy McAllister, WA5ZIB and Ron Johnson, WA5RON. (WA5RON photo.)

## AMSAT® NA

The Radio Amateur Satellite Corporation

Post Office Box 27  
 Washington, DC 20044  
 (301) 589-6062

Non-Profit  
 Organization  
 Second Class  
 POSTAGE PAID  
 at  
 Waterbury, Conn.



Field Day 1987 at K2ZO, Paramus, NJ (KC2EV photo)

LM-1096 KA6M 99.81  
 MAGNUSKI, HANK  
 2019 BARBARA DR.  
 PALO ALTO CA 94303

*Amateur Satellite Report* (ISSN 0889-6089) is published biweekly for \$16 (inseparable from annual membership dues of \$24) by AMSAT, Post Office Box 27, Washington, DC 20044. Second class postage paid at Silver Spring, MD and additional mailing offices. POSTMASTER: send address changes to *Amateur Satellite Report*, Post Office Box 27, Washington, DC 20044.